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DRAFT MERCURY MINIMIZATION PROGRAM GUIDANCE
U.S. EPA Region 5, NPDES Programs Branch
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1. Background and Overview

The following Guidance has been developed in conjunction with the Region 5 states, to address situations where a Pollutant Minimization Program (PMP) is required in a state-issued NPDES permit as a condition for receiving a variance from a water quality-based effluent limitation (WQBEL) for mercury. Many of the specific recommendations are drawn from existing guidance and practices of the Region 5 states (see attachments 1-3). PMP requirements are expected to be imposed on both industrial and municipal permittees; however, because of the more complex and indirect nature of mercury contributions within these systems, these recommendations pertain primarily to Publicly Owned Treatment Works (POTWs). Each POTW affected by these requirements will need to determine how it intends to comply. To the extent that other nearby POTWs will be faced with the same requirements, however, EPA and the States strongly encourage POTWs to coordinate with others in both the development of their PMP Plans, and in the implementation activities to identify and reduce mercury loadings from source sectors.

While it is expected that specific permit language and conditions will vary (see Ohio sample PMP permit language, included in Attachment 2), there are a number of necessary elements for a mercury PMP.

1. A Program Plan, which lays out the POTW's commitments for:
 1. Identification of potential sources of mercury that contribute to discharge levels;
 2. Reasonable, cost-effective activities designed to reduce or eliminate mercury loadings from identified sources;
 3. Tracking mercury source reduction implementation and mercury source monitoring;
 4. Monitoring the POTW's influent, effluent and biosolids, including at least quarterly influent monitoring;
 5. Resources and staffing;
2. Implementation of cost-effective control measures for required and optional source sectors; and
3. An annual status report submitted to the Permitting Authority, which includes:
 1. A list of potential mercury sources;
 2. A summary of actions taken to reduce or eliminate mercury discharges to enable the POTW to meet the WQBEL;
 3. Mercury source reduction implementation and source monitoring results for the previous year;
 4. Proposed adjustments to the Program Plan, based on the findings of 3.c.

The PMP is meant to be a self-revising process. Results from the annual report need to be used to make necessary revisions to the Program Plan and the implementation activities in subsequent years to address problems discovered, and investigate new areas where the pollutant might be found. The goal of the PMP is to maintain the effluent at or below the WQBEL. When this goal

is realized, that is, when the discharger can be reasonably expected to be in compliance with the WQBEL, then the PMP requirements can be removed from the permit. Each element is discussed below.

2. Program Plans

2.1 Requirements to develop PMP Plans.

Requirements to conduct initial monitoring and develop a mercury PMP will be included in a POTW's NPDES permit at the time of reissuance (where a variance has been granted concurrently), as a condition for receiving a variance from a water quality-based effluent limit for mercury, or as triggered by results showing a reasonable potential for violating water quality criteria, based on monitoring conducted during the life of the permit. States have generally been allowing six to eighteen months for development and submittal of PMP Plans, depending on the extent to which the state requires additional data collection in support of the Plan, and the POTW's previous experience with regard to mercury minimization.

2.2 Identification of potential sources of mercury that contribute to discharge levels (to be updated at least annually).

Sources of mercury within a POTW system can be identified using two basic methods: 1) review of existing information sources, and 2) sampling at various points within the sewer system. These activities can be done separately, but an initial review of types and locations of existing users within a system will help design a monitoring plan which focuses on the most potentially significant contributors. The PMP Plan should therefore include a review of existing information regarding industrial, commercial and domestic users of a POTW system. For some source sectors, including most of those in the matrix in Table 1, all individual facilities should be considered likely sources of mercury. For others, such as manufacturing facilities or other Significant Industrial Users, review of production processes, materials usage and discharge information will need to be evaluated. Studies and other literature such as source sector analyses from other POTWs (see <http://www.epa.gov/Region5/air/mercury/mercury.html>), and EPA development documents and Industrial Sector Notebooks on specific industrial categories can be useful sources of information.

Existing influent, effluent and biosolids data should also be evaluated, as well as other available information such as storm water inputs, groundwater (Inflow & Infiltration) inputs, atmospheric deposition, and wastestreams or sewers tributary to the treatment plant. While some States and POTWs may be interested in establishing a mass balance of all mercury inputs so as to be able to characterize controllable versus uncontrollable contributions, it is recommended that the primary focus be on information indicating community sectors and/or geographic locations which are the source of potentially significant contributions.

2.3 Development of Control Strategies

The PMP Plan next needs to describe the POTW's prioritized approach for development of Control Strategies for various source sectors, based on review of existing data and the results of subsequent monitoring. The Plan should also describe any other mercury reduction activities which have already been carried out in a community, as these activities may be substantial and will form a base for the additional activities that will need to be done. At minimum, the sectors in Table 1 must be addressed as part of a POTW's mercury PMP. Consideration should also be given to addressing the sectors in Table 2, although loadings from these sources are generally considered to be less directly related to wastewater discharges. Specific activities and performance measures may vary in order to most efficiently implement effective

mercury reduction outreach or other controls. In addition to describing the proposed activities for each sector, the Plan will also need to include a schedule for implementation which identifies milestones as appropriate.

TABLE 1:

SECTOR	ACTIVITY	PERFORMANCE MEASURE	GOAL
Medical-Hospitals, clinics, nursing homes, veterinarians	-Mail AHA BMP literature -Workshops -Onsite visits -BMP requirements	Date/content Participation Reduction progress, quantity recycled Adoption/implementation	Mercury-free Spill management
Dental clinics	-Mail appropriate BMP literature -Mtgs with dentists -Onsite visits -Survey(s) -BMP requirements (including separators/advanced removal equipment)	Date/content Participation Recycling progress Quantity recycled Adoption/implementation	All adopt capture technology and recycle mercury
Schools-Secondary	-Mail BMP literature -Workshops -Onsite visits	Date/content Participation Reduction progress Quantity of mercury recycled	Mercury-free Spill management
Schools-Colleges/Technical, laboratories	see Medical and School sectors	see Medical and School sectors	
General industry	-Mail chemical/equipment literature -Onsite visit during pretreatment inspection -Application of local limits and/or require BMPs/IU PMP	Date/content Reduction progress Quantity of mercury recycled	Use of low content chemicals/materials Spill management
POTW	-Evaluate chemical/equipment usage	Reduction progress Quantity recycled	Use of low content chemicals/materials

Spill management

General public	-Promote mercury clean sweeps -Displays at community events -Establish local mercury website	Date/contents Quantity of mercury recycled Website hits	Reduced use of mercury containing products Recycling of mercury products Spill management
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TABLE 2:

SECTOR	ACTIVITY	PERFORMANCE MEASURE	GOAL
Thermostats-HVAC Wholesalers/Contractors, Retail stores	-Mail TRC? literature -Workshop -Trade assoc. coordination -Onsite visits -Surveys	Date/content Participation Recycling progress Quantity of mercury recycled	All captured and recycled Spill management
Automobile and appliance switches	-Onsite visits-service centers -Replace hood/trunk switches -Onsite visits-scrapyards -Clip & Recycle switches	Date/content Participation Quantity recycled	All captured/recycled Spill management
Dairy manometers	Mail WDNR brochure	Date/content Participation Quantity recycled	All captured and recycled Spill management
Outside POTW boundaries	see all sectors above	see all sectors above	see all sectors above

Effective control strategies will need to be tailored to the specific source sector, but for each sector should include some combination of the following:

- Formation of partnerships- trade associations, industrial or commercial representatives, local solid and hazardous waste officials, health officials, POTW treatment plant and pretreatment staff, environmental or other public interest organizations, technical assistance providers, academics, etc.;
- Outreach and Education- individual assistance, workshops and training, distribution of information to the general public;
- Participation in statewide or regional efforts (e.g. state dental or hospital associations) to provide outreach and education to association members;
- Collection programs for community residents (e.g. bulk mercury from dentists, thermometer take-

- backs);
- Source control programs for nondomestic users. Nondomestic users with significant contributions can be required to develop their own Pollutant Minimization Programs and control or elimination strategies;
- Promote or require use of Best Management Practices (BMP) for priority sectors (e.g. require dentists to use amalgam separators, or conduct monitoring to determine adequacy of other BMPs);
- Establish local limits for Significant Industrial Users that reflect which sources are “controllable” vs. “uncontrollable” (**see attached discussion on mercury local limit provisions**)

While existing authority should generally be adequate, legal authority issues will need to be considered for some of the strategies. For example, POTWs will need to evaluate their legal authority to ensure that they are able to require Industrial Users to develop mercury minimization plans, or to comply with narrative BMP requirements.

In order to improve the efficiency of educational outreach and mercury product recycling efforts, municipalities should be encouraged to collaborate with others in their area in the preparation and implementation of Mercury PMPs, at least with respect to the control strategies. In addition, local recognition of successful facility or sector mercury reduction activities has proven to be a popular means of encouraging facility participation, and should be strongly encouraged.

2.4 Semiannual monitoring of potential sources of mercury

In addition to review of existing information, PMP plans also need to lay out a POTW’s plans for monitoring known and suspected sources of mercury. The Water Quality Guidance for the Great Lakes System, 40 CFR 132, Appendix F, Procedure 8.D. requires semi-annual monitoring of potential sources of the subject pollutant, and quarterly monitoring of the wastewater treatment plant influent. Where there are large numbers of individual sources (like residential areas), representative sampling could be conducted to determine how much a given type of source adds to the system load, and to gauge the effectiveness of outreach efforts. In some situations, monitoring methods other than chemical analysis (such as mass- or materials-balance) may be appropriate, such as where there is a large number of facilities with low individual loadings, where individual influent monitoring on a large scale is impractical. In general, the plan should lay out a monitoring schedule that will allow the permittee to establish baseline levels, determine the effectiveness of various activities and track progress of the PMP.

POTW monitoring of source reduction activities using the types of performance measures included in Tables 1 and 2 will be another important means for both the POTW and states to determine whether a POTW is meeting its PMP commitments. For example, Wisconsin has established a goal of schools becoming mercury-free. POTWs would be able to monitor and report its progress towards this goal by reporting the number of schools within their jurisdiction, the number of mercury assessments conducted at these schools, and the number that have become mercury free. Where this approach is taken, it is recommended that some spot-test or random sampling program be maintained to measure progress of educational programs, and to identify any odd “hot spots” that may show up.

To ensure that potential sources are not missed, it is also recommended that plans include an in-sewer monitoring scheme that begins with sampling main sewers coming into the treatment plant, and working back through the system to identify particular sources. This may need to include sampling of sediments within sewers or drainage ditches tributary to the sewers to determine if in-place pollutants are contributing to the loading.

2.5 Resources and Staffing

Lastly, PMP Plans need to summarize the resources and staff that will be committed to implementation of mercury PMPs. Specifically, Plans should indicate the source and amount of funding that will be available to carry them out. They should also include the number and position of Full Time Equivalents that will be devoted to PMP implementation.

2.6 State approval of the plans

Review and approval of POTW PMP plans will be necessary to ensure that their implementation moves the POTW towards the goal of maintaining mercury concentrations at or below the WQBEL. As indicated in section 2.1, POTWs should be required to submit proposed plans within a reasonable period of time (typically 6-18 months) from reissuance of the NPDES permit, or as required as a condition for receiving a variance.

Proposed plans should be reviewed based on addressing the necessary elements discussed above. As indicated above, proposing activities in the “recommended” section (Table 2) should generally not be accepted *instead of* activities in the “required” section (Table 1), although the value of addressing those additional sectors should be considered as part of the evaluation of adequacy of the overall plan. Similar consideration should be given to activities that address sources outside a POTW’s jurisdictional boundaries. POTWs need to address comments and make necessary revisions prior to approval of the plans. Upon plan approval, implementation would be required as a condition of the POTW’s NPDES permit.

An example of a basic PMP for a POTW is included in Michigan’s PMP Training Materials in Attachment 1.

3. Program Implementation

Upon approval of a POTW’s Plan, it will be required to carry out and track implementation of its source reduction strategies, and conduct the specified monitoring. While U.S. EPA, the states and others are engaged in identifying the best approaches for addressing mercury sources in the various sectors, much work has been done in this area. POTWs should be encouraged to review available information, and to the greatest extent possible adopt approaches that others have found to be effective. Several of the States in Region 5 have already identified materials that can be used or revised as necessary for distribution to sources in several sectors; these materials are referenced in Attachment 4 (list of websites and addresses for brochures, BMP manuals for various sectors). Other sources of mercury pollution prevention and waste minimization information are available at <http://www.epa.gov/Region5/air/mercury/mercury.html>.

4. Annual status reports

PMP reports are required to be submitted one year after the Program goes into effect, and annually thereafter. For POTWs with pretreatment programs, these reports can be submitted with their Annual Pretreatment Report. Reports need to include a summary of potential sources of the pollutant, a summary of all source control activities, and results of source reduction monitoring and wastewater sampling for the previous year. Proposed adjustments to the Program would also need to be included.

4.1 Potential mercury sources

The annual report shall identify individual facilities or targetted groups within in the various sectors

covered by the plan. A list of new potential sources that have been identified as a result of monitoring or other evaluation also needs to be provided. Status of these facilities with respect to the goals laid out for the different sectors would need to be provided, as described in section 4.3 below.

4.2 Summary of actions taken to reduce or eliminate mercury discharges

This section would include actions taken in response to monitoring results discussed below, and in furtherance of the control strategies laid out in the Plan. Progress with respect to identified goals for the various sectors should be discussed. If no actions were taken to address an identified source or sector, an explanation should be provided.

4.3 Source Reduction and Wastewater Monitoring results

All mercury data that was collected during the previous year should be included with the annual report. This would include tracking of source reduction activities with respect to established sector-specific performance measures as discussed in section 2.4, as well as influent, effluent, biosolids data, and data collected from potential sources. Sampling dates, method of analysis, the laboratory name, and appropriate units should accompany any wastewater monitoring results.

The Water Quality Guidance for the Great Lakes System also calls for at least quarterly influent monitoring for POTWs implementing PMPs. Several of the states have viewed this as a minimum requirement for both influent and effluent, but have required additional, generally monthly monitoring, for larger POTWs (those with flows of greater than 5 million gallons per day). In addition, these states have generally required biosolids monitoring from one to four times per year, with the frequency varying based on the volume of sludge generated.

4.4 Revision of plans

Finally, the Annual Report would need to include any proposed adjustments to a POTW's Program Plan where municipal activities have not been implemented as originally agreed to, source reduction implementation has not occurred, or source reduction implementation has occurred, but has not been effective in reducing mercury discharges.

5. Compliance determinations

Compliance with the mercury permit provisions for a POTW with a mercury variance is determined by evaluating two components of the permit. First, the concentration in the POTW's effluent must be less than the currently achievable level as established through the state's variance process. Second, the facility must be in compliance with the PMP requirements of the permit. Specifically, it would need to have developed the PMP Plan, and then fulfilled the commitments established and agreed to in the approved Plan. After approval of the initial plan, compliance would be evaluated primarily through review of the annual status report, to determine whether the POTW had adequately identified known and potential mercury sources, had carried out the activities it committed to, and had satisfied the specific source reduction and wastewater monitoring requirements. Evaluations for subsequent years would need to take into account revisions described in the previous year's annual report. Where a POTW has collaborated with other POTWs, the reports from the collaborating communities should be reviewed as a group.

Attachment 3- Wisconsin Municipal Mercury PMP Guidance

Attachment 4- List of Sector specific brochures, outreach materials and websites

Approaches to Establishing Local Limits for Mercury

Local limitations are generally developed by POTWs to implement the general and specific prohibitions of the General Pretreatment Regulations, 40 CFR 403, and are established to prevent discharges that cause pass through, interference, or which threaten worker health and safety. EPA's Guidance Manual on the Development and Implementation of Local Discharge

Limitations Under the Pretreatment Program (EPA 833-B87-202, December 1987) identifies ten pollutants, including mercury, which are presumed to be pollutants of concern, and should be evaluated to determine whether local limits should be established. Where established, local limits for mercury and other pollutants are typically expressed as daily maximum and/or a longer term average concentration not to be exceeded, for example 0.2 ug/l.

The National Pretreatment Program, and the underlying General Pretreatment Regulations apply to Industrial Users (IU). An IU is defined as a source of indirect discharge, which in turn is defined as the introduction of pollutants into a POTW from any nondomestic source regulated under Section 307(b)(c) or (d) of the Clean Water Act (40 CFR 403.3(g)). Thus, all non-domestic users of a POTW, which would be considered any user except for a household or dwelling unit, are considered Industrial Users, and are thus subject to Pretreatment Standards and Requirements. And while many POTWs have established local limits for mercury, with some applying these limits to hospitals and other Significant Industrial Users (SIU), mercury local limits have generally not been enforced against “commercial” facilities such as dental clinics, schools, etc. Where these facilities have been addressed, it has generally been through voluntary outreach and education efforts. As discussed in this PMP guidance, promotion of voluntary source reduction will remain an integral part of PMPs. In order to increase participation in implementing BMPs and other source reduction strategies to achieve the greatest possible mercury reductions, however, POTWs will need to consider application of local limits for these commercial users.

Ensuring compliance by all commercial facilities within a POTW’s jurisdiction with uniform concentration-based mercury limits will generally not be desirable or feasible. As an alternative, it is recommended that POTWs establish a mercury limit that applies to all IUs, but then establish alternative methods that can be used by certain commercial or industrial sectors to demonstrate compliance with the limits.

As an example, a POTW could establish a mercury limit of 0.2 ug/l for all IUs (or some subset thereof), to be met within 1 year from adoption of the Ordinance. The Ordinance could then provide users such as dentists the option of satisfying their requirements by installing an amalgam separator approved by the POTW, and complying with BMPs established under the Ordinance. Compliance in such cases would be determined by review of certifications by dentists that they are satisfying those requirements, and by random inspections by the POTW. Those choosing not to install this equipment or follow the BMPs would be required by the Ordinance to apply for and receive a permit (along with payment of any required permit fees) within 1 year of Ordinance Adoption, and monitor and report their compliance with the numeric limit. The POTW would also determine compliance by these facilities with the numeric limit through traditional wastewater sampling.

Similarly, hospitals, schools and other facilities could be allowed to implement BMPs specific to their sectors as an alternative to demonstrating compliance with a numeric local limit.

POTWs using this approach will need to review the basis for their underlying numeric limits, as what may have previously been considered “uncontrollable” loadings from commercial facilities would now be considered “controllable” loadings. This recharacterization could thus result in a

larger Maximum Allowable Industrial Loading (MAIL) (the loading available for IUs), in relation to the Maximum Allowable Headworks Loading (MAHL), as uncontrollable loadings are subtracted from the MAHL in the calculation of MAILs.